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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/033,692	12/21/2001	Renzo Dal Molin	8707.2135	8583

7590

03/11/2004

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EXAMINER

DROESCH, KRISTEN L

ART UNIT	PAPER NUMBER
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3762

DATE MAILED: 03/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/033,692

Applicant(s)

MOLIN, RENZO DAL

Examiner

Kristen L Droesch

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

1. In view of the papers filed 10/11/02, it has been found that this nonprovisional application, as filed, through error and without deceptive intent, improperly set forth the inventorship, and accordingly, this application has been corrected in compliance with 37 CFR 1.48(a). The inventorship of this application has been changed by adding Thierry Legay as inventor and deleting Renzo Dal Molin as inventor.

The application will be forwarded to the Office of Initial Patent Examination (OIPE) for issuance of a corrected filing receipt, and correction of the file jacket and PTO PALM data to reflect the inventorship as corrected.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: MEASUREMENT OF COMPLEX IMPEDANCE OF AN IMPLANTABLE LEAD.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 7-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 includes the method step of measuring in a device claim. It is suggested to amend the claim to utilize means plus function language.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(f) he did not himself invent the subject matter sought to be patented.

5. Claims 1-12 are rejected under 35 U.S.C. 102(f) because the applicant did not invent the claimed subject matter. A question of inventorship arises due to the inventor named in the foreign priority document (French Patent Application No. 00 16906) being inconsistent with the inventorship (as amended) of this application.

6. Claims 1-2, and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Baura (6,058,325).

Regarding claim 1, Baura shows a process for measuring the complex impedance of a lead comprising discharging a tank capacitor (12) to produce a stimulation pulse; measuring a voltage variation $V_{out}(t)$ measuring a voltage variation at the terminals of the tank capacitor during the discharge; and determining the lead impedance based on the measured voltage comprising sampling at least three successive values of the voltage ($V_{out}(t)$ is collected at 1000 Hz or less and optionally decimated) at the tank capacitor terminals; and determining separately a resistive component (R') and a capacitive component (C') of the impedance from the sampled values (Col. 4, line 21 - Col. 8, line 7)

With respect to claim 2, Baura shows the determination is operated by an algebraic calculation (Col. 4, line 21 - Col. 8, line 7).

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Regarding claim 4, Baura shows sampling the at least three successive values further comprises sampling the at least three successive values during the same pulse (Col. 6, lines 45-52).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3, and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baura (6,058,325). Baura is as explained before.

Regarding claim 3, Baura discloses the claimed invention except for the time of the third sampling time corresponding to twice the duration of between the second time and the first time at the beginning of the stimulation pulse. It would have been an obvious design choice to one with ordinary skill in the art at the time the invention was made to modify the timing of the sampling as taught by Baura with the third sampling time corresponding to twice the duration of between the second time and the first time at the beginning of the stimulation pulse, since applicant has not disclosed that this particular timing of sampling provides any criticality and /or unexpected results and it appears that the invention would perform equally well with any timing of the sampling such as sampling at 1000 Hz or less with optional decimation as taught by Baura for sampling the voltage and determining the resistive and capacitive components of lead impedance.

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With respect to claims 5-6, Baura discloses the claimed invention except for sampling at least three successive values during two successive stimulation pulses with the second pulse having twice the duration of the first pulse and sampling the first time at the beginning of the first pulse sampling the second time at the end of the first pulse and sampling the third time at the end of the second pulse. It would have been an obvious design choice to one with ordinary skill in the art at the time the invention was made to modify the timing of the sampling as taught by Baura with sampling at least three successive values during two successive stimulation pulses with the second pulse having twice the duration of the first pulse and sampling the first time at the beginning of the first pulse sampling the second time at the end of the first pulse and sampling the third time at the end of the second pulse, since applicant has not disclosed that this particular timing of sampling provides any criticality and /or unexpected results and it appears that the invention would perform equally well with any timing of sampling such as sampling at 1000 Hz or less with optional decimation taught by Baura for sampling the voltage and determining the resistive and capacitive components of lead impedance.

Claims 7-8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baura (6,058,325) in view of Busch et al. (6,304,781). Baura shows a device including means for discharging a tank capacitor (12) to produce a stimulation pulse; means for measuring a voltage variation $V_{out}(t)$ measuring a voltage variation at the terminals of the tank capacitor during the discharge; and means for determining the lead impedance based on the measured voltage comprising means for sampling at least three successive values of the voltage ($V_{out}(t)$ is collected at 1000 Hz or less and optionally decimated) at the tank capacitor terminals; and means for determining separately a resistive component (R') and a capacitive component (C') of the

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impedance from the sampled values (Col. 4, line 21 - Col. 8, line 7). Although Baura fails to show the device is an implantable medical device, attention is directed to Busch et al. which teaches an implantable medical device that measures the capacitive impedance of electrodes. Therefore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to modify the device of Baura to be an implantable medical device since Busch et al shows it is also desirable to measure the impedance (and its components) of electrodes associated with an implantable medical device.

With respect to claim 8, Baura shows the determination means comprises an algebraic calculation (Col. 4, line 21 - Col. 8, line 7).

Regarding claim 10, Baura shows the sampling means further comprises sampling the at least three successive values during the same stimulation pulse (Col. 6, lines 45-52).

With respect to claim 9, Baura and Busch et al. disclose the claimed invention except for the time of the third sampling time corresponding to twice the duration of between the second time and the first time at the beginning of the stimulation pulse. It would have been an obvious design choice to one with ordinary skill in the art at the time the invention was made to modify the timing of the sampling as taught by Baura and Busch et al. with the third sampling time corresponding to twice the duration of between the second time and the first time at the beginning of the stimulation pulse, since applicant has not disclosed that this particular timing of sampling provides any criticality and /or unexpected results and it appears that the invention would perform equally well with any timing of the sampling such as sampling at 1000 Hz or less with optional decimation as taught by Baura and Busch et al. for sampling the voltage and determining the resistive and capacitive components of lead impedance.

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Regarding claims 11-12, Baura and Busch et al. disclose the claimed invention except for sampling at least three successive values during two successive stimulation pulses with the second pulse having twice the duration of the first pulse and sampling the first time at the beginning of the first pulse sampling the second time at the end of the first pulse and sampling the third time at the end of the second pulse. It would have been an obvious design choice to one with ordinary skill in the art at the time the invention was made to modify the timing of the sampling as taught by Baura and Busch et al. with sampling at least three successive values during two successive stimulation pulses with the second pulse having twice the duration of the first pulse and sampling the first time at the beginning of the first pulse sampling the second time at the end of the first pulse and sampling the third time at the end of the second pulse, since applicant has not disclosed that this particular timing of sampling provides any criticality and /or unexpected results and it appears that the invention would perform equally well with any timing of sampling such as sampling at 1000 Hz or less with optional decimation taught by Baura and Busch et al. for sampling the voltage and determining the resistive and capacitive components of lead impedance.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Meier (6,522,924) shows a implantable medical device which determines the real and imaginary portions of a myocardial impedance pattern. Hansen et al. (5,431,692) shows discharging a tank capacitor and measuring the resultant voltage to determine the impedance of electrodes. Keuhn (5,201,865) shows determining lead impedance from the measurement of the resulting voltage following discharge of the capacitors. Paul et al. (5,814,088) shows an

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implantable medical device which discharges a tank capacitor and measures the impedance of the electrodes.

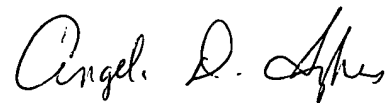
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kristen L Droesch whose telephone number is 703-605-1185. The examiner can normally be reached on M-F, 10:00 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angie Sykes can be reached on 703-308-5181. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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